$costvar,\ c$
$termvar,\ x,\ y,\ z,\ f$
$baseAttackVar,\ b$
$index,\ i,\ j,\ k$

$$
\begin{array}{lll}
op & ::= & \\
 & | & \mathsf{op}_{\odot} \\
 & | & \mathsf{op}_{\triangleright} \\
 & | & \mathsf{op}_{\sqcup} \\
 & | & \mathsf{rel}_{\multimap} \\
 & | & \mathsf{rel}_{\circ\!\!-\!\!\circ} \\
 & | & \mathsf{rel}_{\rightarrow}(c, -) \\
 & | & \mathsf{rel}_{\leftarrow}(c, -) \\
 & | & \mathsf{rel}_{\multimap}(c, -) \\
 & | & \mathsf{rel}_{\circ\!\!-\!\!\circ}(c, -)
\end{array}
$$

$$
\begin{array}{lll}
C & ::= & \\
 & | & c \\
 & | & op(C_1, C_2)
\end{array}
$$

$$
\begin{array}{lll}
T & ::= & \\
 & | & b \\
 & | & T_1 \odot T_2 \\
 & | & T_1 \triangleright T_2 \\
 & | & T_1 \sqcup T_2 \\
 & | & (T)
\end{array}
$$

$$
\begin{array}{lll}
E & ::= & \\
 & | & b \\
 & | & E_1 \odot E_2 \\
 & | & E_1 \triangleright E_2 \\
 & | & E_1 \sqcup E_2 \\
 & | & (E_1, c) \multimap E_2 \\
 & | & E_1 \circ\!\!-\!\!\circ E_2 \\
 & | & (E) \qquad\qquad \mathsf{S}
\end{array}
$$

$$
\begin{array}{lll}
\Gamma,\ \Delta,\ \Theta,\ \Phi,\ \Psi & ::= & \\
 & | & \cdot \\
 & | & (E, c) \\
 & | & \Theta, \Psi
\end{array}
$$

$\boxed{\Delta \vdash^T_C\ T}$

$$\frac{}{(b, c) \vdash^T_c\ b}\quad \text{T\_VAR}$$

$$\frac{\Delta_1 \vdash^T_{c_1}\ T_1 \quad \Delta_2 \vdash^T_{c_2}\ T_2}{\Delta_1, \Delta_2 \vdash^T_{\mathsf{op}_{\odot}(c_1, c_2)}\ T_1 \odot T_2}\quad \text{T\_PARA}$$

$$\frac{\Delta_1 \vdash^T_{c_1}\ T_1 \quad \Delta_2 \vdash^T_{c_2}\ T_2}{\Delta_1, \Delta_2 \vdash^T_{\mathsf{op}_{\triangleright}(c_1, c_2)}\ T_1 \triangleright T_2}\quad \text{T\_SEQ}$$

$$\frac{\Delta_1 \vdash^T_{c_1} T_1 \quad \Delta_2 \vdash^T_{c_2} T_2}{\Delta_1, \Delta_2 \vdash^T_{\mathsf{op}_\sqcup(c_1,c_2)} T_1 \sqcup T_2} \quad \text{T\_CHOICE}$$

$\boxed{\Theta; \Phi; \Psi \vdash_C E}$

$$\frac{}{\cdot;\cdot;(E,c) \vdash_c E} \quad \text{E\_VAR}$$

$$\frac{}{\cdot;(E,c);\cdot \vdash_c E} \quad \text{E\_VARCC}$$

$$\frac{}{(E,c);\cdot;\cdot \vdash_c E} \quad \text{E\_VARC}$$

$$\frac{\cdot \vdash^T_c T_1 \odot (T_2 \rhd T_3)}{\cdot;\cdot;\cdot \vdash_c (T_1 \odot (T_2 \sqcup T_3)) \multimap ((T_1 \odot T_2) \sqcup (T_1 \odot T_3))} \quad \text{E\_DISTPARA1}$$

$$\frac{\cdot \vdash^T_c T_1 \rhd (T_2 \sqcup T_3)}{\cdot;\cdot;\cdot \vdash_c (T_1 \rhd (T_2 \sqcup T_3)) \multimap ((T_1 \rhd T_2) \sqcup (T_1 \rhd T_3))} \quad \text{E\_DISTSEQ1}$$

$$\frac{\cdot \vdash^T_c (T_2 \rhd T_3) \odot T_1}{\cdot;\cdot;\cdot \vdash_c ((T_2 \sqcup T_3) \odot T_1) \multimap ((T_2 \odot T_1) \sqcup (T_3 \odot T_1))} \quad \text{E\_DISTPARA2}$$

$$\frac{\cdot \vdash^T_c (T_2 \sqcup T_3) \rhd T_1}{\cdot;\cdot;\cdot \vdash_c ((T_2 \sqcup T_3) \rhd T_1) \multimap ((T_2 \rhd T_1) \sqcup (T_2 \rhd T_1))} \quad \text{E\_DISTSEQ2}$$

$$\frac{\Theta_1; \Phi_1; \Psi_1 \vdash_{c_1} E_1 \quad \Theta_2; \Phi_2; \Psi_2 \vdash_{c_2} E_2}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash_{\mathsf{op}_\odot(c_1,c_2)} E_1 \odot E_2} \quad \text{E\_PARAI}$$

$$\frac{\Theta_1; \Phi_1; \Psi_2 \vdash_{\mathsf{op}_\odot(c_1,c_2)} E_1 \odot E_2 \quad \Theta_2; \Phi_2; \Psi_1, (E_1, c_1), (E_2, c_2), \Psi_3 \vdash_{c_3} E_3}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2, \Psi_3 \vdash_{c_3} E_3} \quad \text{E\_PARAE}$$

$$\frac{\Theta_1; \Phi_1; \Psi_1 \vdash_{c_1} E_1 \quad \Theta_2; \Phi_2; \Psi_2 \vdash_{c_2} E_2}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash_{\mathsf{op}_\sqcup(c_1,c_2)} E_1 \sqcup E_2} \quad \text{E\_CHOII}$$

$$\frac{\Theta_1; \Phi_2; \Psi_1 \vdash_{\mathsf{op}_\sqcup(c_1,c_2)} E_1 \sqcup E_2 \quad \Theta_2; \Phi_1, (E_1, c_1), (E_2, c_2), \Phi_3; \Psi_2 \vdash_{c_3} E_3}{\Theta_1, \Theta_2; \Phi_1, \Phi_2, \Phi_3; \Psi_1, \Psi_2 \vdash_{c_3} E_3} \quad \text{E\_CHOIE}$$

$$\frac{\Theta_1; \Phi_1; \Psi_1 \vdash_{c_1} E_1 \quad \Theta_2; \Phi_2; \Psi_2 \vdash_{c_2} E_2}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash_{\mathsf{op}_\rhd(c_1,c_2)} E_1 \rhd E_2} \quad \text{E\_SEQI}$$

$$\frac{\Theta_2; \Phi_1; \Psi_2 \vdash_{\mathsf{op}_\rhd(c_1,c_2)} E_1 \rhd E_2 \quad \Theta_1, (E_1, c_1), (E_2, c_2), \Theta_3; \Phi_2; \Psi_2 \vdash_{c_3} E_3}{\Theta_1, \Theta_2, \Theta_3; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash_{c_3} E_3} \quad \text{E\_SEQE}$$

$$\frac{\Theta; \Phi; \Psi_1, (E_1, c_1), (E_2, c_2), \Psi_2 \vdash_c E}{\Theta; \Phi; \Psi_1, (E_2, c_2), (E_1, c_1), \Psi_2 \vdash_c E} \quad \text{E\_EXS}$$

$$\frac{\Theta; \Phi_1, (E_1, c_1), (E_2, c_2), \Phi_2; \Psi \vdash_c E}{\Theta; \Phi_1, (E_2, c_2), (E_1, c_1), \Phi_2; \Psi \vdash_c E} \quad \text{E\_EXC}$$

$$\frac{\Theta; \Phi_1, (E_1, c_1), \Phi_2; \Psi \vdash_{c_2} E_2}{\Theta; \Phi_1, (E_1, c_1), (E_1, c_1), \Phi_2; \Psi \vdash_{c_2} E_2} \quad \text{E\_DUP}$$

$$\frac{\Theta; \Phi_1, (E_1, c_1), (E_1, c_1), \Phi_2; \Psi \vdash_{c_2} E_2}{\Theta; \Phi_1, (E_1, c_1), \Phi_2; \Psi \vdash_{c_2} E_2} \quad \text{E\_CONT}$$

$$\frac{\Theta; \Phi; \Psi, (E_1, c_1) \vdash_{c_2} E_2 \quad \mathsf{rel}_\multimap(c_1, c_2)}{\Theta; \Phi; \Psi \vdash_{c_2} (E_1, c_1) \multimap E_2} \quad \text{E\_IMPI}$$

$$\frac{\Theta_1; \Phi_1; \Psi_1 \vdash_{c_2} (E_1, c_1) \multimap E_2 \quad \Theta_2; \Phi_2; \Psi_2 \vdash_{c_1} E_1}{\Theta_1, \Theta_2; \Phi_1, \Phi_2; \Psi_1, \Psi_2 \vdash_{c_2} E_2} \quad \text{E\_IMPE}$$

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Definition rules:          23 good    0 bad
Definition rule clauses:   42 good    0 bad
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